

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently amended) A method of reducing or eliminating the effect of fly ash or other combustible ashes on air entrainment in producing an air-entraining cementitious mixture ~~containing fly ash~~, comprising the steps of:

forming a cementitious mixture comprising water, cement, fly ash or another combustible ash, and an air entrainment agent, and entraining air in the mixture;

wherein ~~an amount~~ of a sacrificial agent is also included in the cementitious mixture in at least the amount necessary to neutralize the detrimental effects of components of said fly ash or other combustible ash on air entrainment activity, the sacrificial agent ~~comprises~~ comprising a material or mixture of materials that, when present in ~~said~~ the same cementitious mixture without fly ash or the other combustible ash in said amount, ~~at least partially neutralizes detrimental effects of components of said fly ash on air entrainment activity of said air entrainment agent, said sacrificial agent present in said amount causing~~ causes less than 2 vol.% additional air entrainment content in the cementitious mixture, wherein the sacrificial agent comprises an organic compound, with the proviso that said sacrificial agent does not comprise polyethylene glycol (PEG) or aromatic compounds having carboxylic acid groups, or salts thereof.

2. (Currently amended) The method of claim 1, wherein said amount of said sacrificial agent exceeds an amount necessary to neutralize said detrimental effects of said components of said fly ash or other combustible ash.

3. (Currently amended) The method of claim 1, wherein said fly ash or other combustible ash may vary in content of said components from a minimum content to a maximum content according to a source or batch of said fly ash or other combustible ash, and wherein said amount of said at least one sacrificial agent exceeds an amount necessary to neutralize said detrimental effects of said components of said fly ash when present in said maximum content.
4. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises a compound selected from the group consisting of aromatic compounds bearing either sulfonate or amino functional groups or combinations of said groups, glycols and glycol derivates having molecular weights of 2000 Da or less, and mixtures thereof, with the proviso that said glycol derivative is not polyethylene glycol (PEG).
5. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises a compound selected from the group consisting of benzylamine, sodium 2-naphthalene sulfonate, sodium di-isopropyl naphthalene sulfonate, sodium cumene sulfonate, sodium di-butyl naphthalene sulfonate, ethylene glycol phenyl ether, ethylene glycol methyl ether, butoxyethanol, di-ethylene glycol butyl ether, di-propylene glycol methyl ether, ~~and~~ 1-phenyl 2-propylene glycol, and mixtures thereof.
6. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises a member of a class of organic chemicals, said class being selected from the group consisting of alcohols, diols, polyols, ethers, esters, carboxylic acids, carboxylic acid derivatives, aromatic sulfonates, amines, alcoholamines, amides, ammonium salts, ~~and~~ polyglycols, and mixtures thereof, with the provisos that said polyglycols are not polyethylene glycols, and said carboxylic acids ~~or~~ and said carboxylic acid derivatives are not aromatic carboxylic acids or salts thereof.
7. (Original) The method of claim 6, wherein said sacrificial agent has a value of LogK_{ow} in the range of -3 to +2.

8. (Original) The method of claim 6, wherein said sacrificial agent has a value of LogK_{ow} in the range of -2 to +2.
9. (Previously Presented) The method of claim 6, wherein said sacrificial agent has an HLB value in the range of 5 to 20.
10. (Cancelled).
11. (Previously Presented) The method of claim 9, wherein said sacrificial agent is a mixture of compounds of different HLB values that together provide the sacrificial agent with an HLB value in said range of 5 to 20.
12. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises an alcohol selected from the group consisting of n-propanol, i-propanol, 1-butanol, 2-butanol, tertiary butanol, 1-pentanol, 3-pentanol, neopentanol, hexanol, benzyl alcohol ~~and~~ phenylethyl alcohol, and mixtures thereof.
13. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises an ether selected from ethylene glycol methyl ether, ethylene glycol ethyl ether, ethylene glycol n-propyl ether, ethylene glycol n-butyl ether, ethylene glycol iso-butyl ether, ethylene glycol phenyl ether, propylene glycol phenyl ether, di-propylene glycol mono methyl ether, di-ethylene glycol butyl ether, ethylene glycol di-methyl ether, tri-ethylene glycol, tri-propylene glycol, polypropylene glycol 425 and P(EG-ran-propylene-glycol) 2500, ~~and~~ p-dimethoxybenzene, and mixtures thereof.
14. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises an ester selected from the group consisting of methyloctanoate, methylaurate, methylpalmitate, methyloleate, ethylene glycol mono-ethyl ether acetate, ethylpropionate, ethylbutyrate, ethylcaproate, ~~and~~ POE(20) sorbitan monolaurate, and mixtures thereof.

15. (Previously presented) The method of claim 1, wherein said sacrificial agent comprises hexanoic acid.
16. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises an aromatic sulfonate selected from the group consisting of 4-ethyl benzene sulfonic acid, 2-naphthalenesulfonate Na, p-toluene sulfonic acid, ~~and~~ methyl naphthalene sulfonate, and mixtures thereof.
17. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises an amine selected from the group consisting of triethylamine, n-butyl amine, aniline, ~~and~~ benzyl amine, and mixtures thereof.
18. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises an alcoholamine selected from the group consisting of 2-(2-aminoethoxy)ethanol, di-isopropanolamine, ~~and~~ tri-isopropanolamine, and mixtures thereof.
19. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises an amide selected from the group consisting of urea, dimethylurea, ~~and~~ n-butyl urea, and mixtures thereof.
20. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises an ammonium salt selected from the group consisting of tetrapropyl ammonium hydroxide, ~~and~~ tetrabutyl ammonium chloride, and mixtures thereof.
21. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises a polyglycol selected from the group consisting of tri-ethylene glycol, tri-propylene glycol, polypropylene glycol 425, ~~and~~ P(EG-ran-propylene-glycol) 2500, and mixtures thereof.

22. (Currently amended) The method of claim 1, wherein said sacrificial agent comprises a compound selected from the group consisting of 2-butanone, methylisobutylketone, butyraldehyde, 1-ethyl-2-pyrrolidinone, ~~and~~ [[n]] N-vinyl-2-pyrrolidinone, and mixtures thereof.
23. (Original) The method of claim 1, wherein the sacrificial agent present is a mixture of two or more compounds.
24. (Previously presented) The method of claim 1, wherein said sacrificial agent comprises a compound having hydrophobic lipophilic balance rating in the range of 5 to 20.
25. (Previously presented) The method of claim 1, wherein said sacrificial agent comprises a compound for which LogK_{ow} is in the range of -3 to +2.
26. (Previously presented) The method of claim 1, wherein said sacrificial agent comprises a compound for which LogK_{ow} is in the range of -2 to +2.
27. (Previously presented) The method of claim 1, wherein said sacrificial agent comprises a compound having a second protocol ranking of 1 or more.
28. (Previously presented) The method of claim 1, wherein said sacrificial agent comprises a compound having a second protocol ranking of 2 or more.
29. (Previously presented) The method of claim 1, wherein said sacrificial agent comprises a compound having a second protocol ranking of 3 or more.
30. (Previously presented) The method of claim 1, wherein said sacrificial agent comprises a compound having a second protocol ranking of 4.

31. (Previously presented) The method of claim 1, wherein said sacrificial agent comprises a combination of ethylene glycol phenyl ether and sodium di-isopropyl naphthalene sulfonate.
32. (Original) The method of claim 31, wherein the relative proportion of said ethylene glycol phenyl ether and said sodium di-isopropyl naphthalene sulfonate is in the range of relative weight ratios between 1:5 and 50:1.
33. (Currently amended) The method of claim 1, wherein said sacrificial agent is mixed with ~~added to~~ said air entrainment agent prior to mixing said sacrificial agent and said air entrainment agent with the fly ash or other combustible ash, cement and water.
34. (Currently amended) The method of claim 1, wherein said sacrificial agent is mixed with ~~added to~~ the fly ash or other combustible ash prior to mixing said sacrificial agent and said fly ash or other combustible ash with said cement, water and said air entrainment agent.
35. (Currently amended) The method of claim ~~32~~ 34, wherein said sacrificial agent is added to said fly ash or other combustible ash by spraying a liquid ~~containing~~ comprising said sacrificial agent onto said fly ash or other combustible ash.
36. (Currently amended) The method of claim ~~32~~ 34, wherein said sacrificial agent is added to said fly ash or other combustible ash by mixing a spray-dried solid containing said sacrificial agent with said fly ash or other combustible ash.
37. (Currently amended) The method of claim 1, wherein said sacrificial agent is added after the fly ash or other combustible ash, cement, water and air entrainment agent have been mixed together.

38. (Currently amended) The method of claim 1, wherein said amount of sacrificial agent is at least 0.01% by weight of said fly ash or other combustible ash.
39. (Currently amended) The method of claim 1, wherein said amount of sacrificial agent is in the range of 0.01 to 2.0% by weight of said fly ash or other combustible ash.
40. (Currently amended) The method of claim 1, wherein said amount of sacrificial agent is in the range of 0.1 to 1.0% by weight of said fly ash or other combustible ash.
41. (Currently amended) The method of claim 1, wherein said amount of said sacrificial agent[[s]] is in the range of 0.01% to 0.5% by weight of the total amount of cementitious material including said fly ash or other combustible ash.
42. (Currently amended) The method of claim 1, wherein said amount of said sacrificial agents is in the range of 0.01% to 0.2% by weight of the total amount of cementitious material including fly ash or other combustible ash.
43. (Currently amended) The method of claim 1, wherein an additional material selected from the group consisting of sand, aggregate, ~~and~~ concrete modifier, and ~~a~~ combinations thereof, is incorporated into said mixture.
- 44-106. (Cancelled)
107. (Currently amended) The method of claim 1, wherein said cementitious mixture is formed by mixing an amount of said sacrificial agent with said fly ash or other combustible ash to form a pre-treated fly ash or other combustible ash, and then mixing said pre-treated fly ash or other combustible ash with said water, said air entrainment agent and said cement.

108. (Currently amended) The method of claim 1, wherein said cementitious mixture is formed by mixing said air entrainment agent and said sacrificial agent to form a component mixture, and then mixing said component mixture with said water, fly ash or other combustible ash and cement, and entraining said air in said mixture.
109. (Currently amended) The method of claim 1, wherein water, cement, fly ash or other combustible ash, air entrainment agent and sacrificial agent are mixed together simultaneously while entraining said air in the mixture.
110. (Currently amended) The method of claim 1, wherein said sacrificial agent is mixed with said water, cement and fly ash or other combustible ash before said air entrainment agent is added.
111. (Currently amended) The method of claim 1, wherein said sacrificial agent is mixed with said water, cement and fly ash or other combustible ash at the same time as said air entrainment agent.
112. (Cancelled)
113. (Previously presented) The method of claim 6, wherein the sacrificial agent comprises an ether.
114. (Previously presented) The method of claim 113, wherein the ether is further defined as a glycol ether.
115. (Currently amended) The method of claim 114, wherein the glycol ether ~~is further defined as~~ comprises ethylene glycol methyl ether, ethylene glycol ethyl ether, ethylene glycol n-propyl ether, ethylene glycol n-butyl ether, ethylene glycol iso-butyl ether, ethylene glycol phenyl ether, propylene glycol phenyl ether, di-propylene glycol mono

methylether, di-ethylene glycol butyl ether, ethylene glycol di-methylether, tri-ethylene glycol, tri-propylene glycol, ~~or~~ P(EG-ran-propylene-glycol) 2500, or mixtures thereof.

116. (Currently amended) The method of claim 115, wherein the glycol ether ~~[[is]]~~ comprises ethylene glycol phenyl ether.
117. (Previously presented) The method of claim 113, wherein the ether is further defined as a polyglycol ether.
118. (Currently amended) The method of claim 117, wherein the polyglycol ether comprises ~~is further defined as~~ polypropylene glycol 425, ~~or~~ P(EG-ran-propylene-glycol) 2500, or mixtures thereof.
119. (Canceled)
120. (New) The method of claim 1, wherein said fly ash or other combustible ash consists essentially of fly ash.
121. (New) The method of claim 1, wherein said fly ash or other combustible ash comprises a blend of fly and another combustible ash.
122. (New) The method of claim 6, wherein the sacrificial agent comprises an amine.
123. (New) The method of claim 23, wherein the mixture of two or more compounds together have a hydrophobic lipophilic balance rating in the range of 5 to 20.
124. (New) The method of claim 23, wherein the mixture of two or more compounds together have a LogK_{ow} is in the range of -3 to +2.

125. (New) The method of claim 23, wherein the mixture of two or more compounds together have a LogK_{ow} is in the range of -2 to +2.
126. (New) The method of claim 1, wherein the sacrificial agent, when present in the same cementitious mixture without fly ash or the other combustible ash in said amount causes less than 1 vol.% additional air content in the cementitious mixture.
127. (New) The method of claim 1, further comprising the step of selecting a sacrificial agent comprising a material or mixture of materials to reduce or eliminate the effect of fly ash or another combustible ash on air entrainment in a cementitious mixture and selecting an amount of the sacrificial agent such that the amount is at least an amount necessary to neutralize the detrimental effects of components of said fly ash on air entrainment activity and the amount of sacrificial agent causes less than 2 vol.% additional air content in the same cementitious mixture without fly ash or the other combustible ash.
128. (New) The method of claim 127, wherein said fly ash or other combustible ash has a predetermined maximum carbon content and the amount of sacrificial agent exceeds the amount necessary to neutralize the maximum carbon content in the fly ash or other combustible ash.
129. (New) The method of claim 2, wherein the sacrificial agent amount used does not result in a substantial increase in air entrainment compared to providing the sacrificial agent in an amount necessary to neutralize the detrimental effects of components of said fly ash on air entrainment activity.
130. (New) The method of claim 129, wherein the sacrificial agent causes less than 2 vol.% additional air content in the cementitious mixture without fly ash.
131. (New) The method of claim 1, wherein said components are carbon content.

132. (New) A method of reducing or eliminating the effect of fly ash on air entrainment in an air-entraining cementitious mixture, comprising the steps of:
- forming a cementitious mixture comprising water, cement, fly ash, and an air entrainment agent, and entraining air in the mixture;
- wherein a sacrificial agent is also included in the cementitious mixture in at least the amount necessary to neutralize the detrimental effects of the carbon content of said fly ash on air entrainment activity, the sacrificial agent comprising a material or mixture of materials that, when present in the same cementitious mixture without fly ash in said amount causes less than 2 vol.% additional air content in the cementitious mixture,
- wherein the sacrificial agent comprises an organic compound, with the proviso that said sacrificial agent does not comprise polyethylene glycol (PEG) or aromatic compounds having carboxylic acid groups, or salts thereof.
133. (New) A method of addressing the variance of carbon content in fly ash used in cementitious compositions to provide a cementitious composition with a substantially constant level of air entrainment, comprising:
- forming a cementitious mixture comprising water, cement, fly ash, an air entrainment agent, and a sacrificial agent and entraining air in the mixture, wherein the fly ash has a maximum carbon content; and
- selecting a sacrificial agent for the cementitious mixture and an amount of the sacrificial agent such that the amount of the sacrificial agent exceeds the amount necessary to neutralize the maximum carbon content in the fly ash,
- wherein the sacrificial agent comprises a material or mixture of materials that, when present in the same cementitious mixture without fly ash in said amount causes less than 2 vol.% additional air content in the cementitious mixture, and
- wherein the sacrificial agent comprises an organic compound, with the proviso that said sacrificial agent does not comprise polyethylene glycol (PEG) or aromatic compounds having carboxylic acid groups, or salts thereof.